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REPORT ON THE MOUNTAIN PINE BEETLE

IN RAINIER NATIONAL PARK

Season of 1929

By

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At the request of Superintendent Tomlinson of Rainier National Park a brief survey was made, by the writer as a representative of the Forest Insect Field Station at Coeur d'Alene, Idaho, to determine the approximate amount of damage caused by forest insects within the Park. Three days (October 8-11, 1929) were spent in making the survey.

The Park Service cooperated in every way possible by furnishing a guide and transportation, as well as extending many other kindnesses which have been greatly appreciated.

The regions inspected were in the locality of Longvue Springs in the southwest, and the White River entrance in the northeast portion of the Park. While a constant watch for other insect depredations was kept, none of any importance was found but that of the mountain pine beetle which was killing white pine in the region of the Ramparts a short distance northeast of Longvue Springs, and at the White River entrance along the new road that is being built to Yakima Park.

In the first locality the infestation appeared to be in a primary position, i.e., the beetles were attacking trees that were in an healthy stand. The trees examined in the area contained very heavy broods in the larval and new adult stage.

In many cases trees that were just beginning to fade (which usually indicates that there are still insects under the bark) were found to have many emergence holes caused by adult beetles boring out through the bark. It was found that the emergence was due to two things: First, the tree had been attacked on one side of the bole the previous year by the beetles, - the grubs of which had transformed and emerged the past summer. The tree being injured on but one side remained green on the other and was reattacked in this green area by perhaps the beetles that had emerged from the same tree. The grubs of the last mentioned beetles by feeding on the remaining green tissue killed the tree. Thus, though the foliage was just fading this fall, one could find emergence holes in the bark. This type of tree should be treated, if control methods are instituted, for the brood on the other side of the tree is as apt to start an epidemic as that from a tree killed in one season. The second cause of emergence holes is the result of the beetles which attack the tree chewing out after they have laid their eggs. A long, dry season usually results in such an emergence. Trees of this type should be treated too, for though the parents have escaped, their progeny which are much more numerous were left behind. One can tell after a little practice whether it is the old beetles or the transformed brood that made the emergence holes, by chipping off the bark containing the hole and observing whether the opening is over the main (egg) gallery or over a larval mine or pupal pit. If over the former it is a parent beetle; if over the latter it is a new adult.

Care should be taken, however, in the first type of tree not to mistake the work of secondary insects like Ips, Pityogenes, etc. for the work of the mountain pine beetle. Figure 2 shows the characteristic work of the mountain pine beetle.

In the region of the Ramparts some forty odd trees were counted. These were found on both sides of the road but most of them were west of it. There were probably 25 or more that were not visible in that region; from Longvire Springs looking west one could see six or seven other trees, so that altogether there are probably 75 trees that require treating -- and treatment before the spring emergence if the few white pine in that region are to be saved. If no control work is done there the increase in brood will probably account for about 100 trees the coming summer.

However, in the region of the White River entrance there do not seem to be as many white pines being killed. The trees that were killed had for the most part been weakened, either by the blasting done during the construction of the new Yakima Park Road, or by the filling-in on the same construction operation. Some twenty trees were counted which contained brood. One group of about 5 or 9 trees showed no sign of blasting injury and were out of the filling-in area. But some other trees nearby had been "weakened" the previous year and infested by the insects which, emerging this season (1929), attacked the apparently healthy trees. All the trees examined had good brood so that it is more than likely that there will be a substantial increase next summer if no control measures are undertaken.

In particular one immense white pine and one or two smaller ones were found infested within a very short distance of the new entrance that is being built on the Yakima Park road. It would certainly seem a wise move to cut these at least before the other pine in the region becomes infested and further disfigures the entrance.

Altogether there are at least 100 infested white pine which should be treated. It is believed that \$500 would be just about enough to adequately treat that many trees.

Below will be found a brief description of the adult and an account of the life history of this insect - the mountain pine beetle (Dendroctonus monticolae) with photograph of the adult and its work.

The mountain pine beetle (Figure 1) is a small but stout, cylindrical, black barkbeetle, averaging $1/5$ inch in length. It always excavates its galleries straight up the trunk between the wood and the bark, packing the boring dust behind it as it works (Figure 2). Other barkbeetles not belonging to the genus Dendroctonus, but sometimes resembling it, do not pack the cambium shreds in the gallery but force them out of the entrance hole, thus leaving the galleries clear. The adult mountain pine beetle lays her eggs on both sides of the gallery. The grubs which hatch from the eggs mine the cambium tissues, thereby killing the tree. In many instances in Rainier Park there appeared to be a generation and a half a year. Some trees contained brood which overwinters in the larval stage, changes to a pupa in June, and emerges in early July. Other trees contained brood overwintering in the new adult stage. These will emerge

in early spring to attack the surrounding healthy trees. The brood from these trees will probably mature by August, emerge, make their attacks, and lay eggs -- thereby completing a cycle and a half, as the eggs will hatch and the grubs have time to feed for a fair period before cold weather sets in.

The beetle grubs are heavily parasitized in many localities by a small wasp-like insect which bores through the bark with its ovipositor and lays a single egg on a beetle larva. When the parasite egg hatches the parasite larva feeds on the beetle grub for about six weeks, then spins a silken cocoon about 1/5" long in which it remains until the following spring when it transforms and chews its way out through the bark.

In Rainier Park this parasite was found to be rather abundant, in a few instances killing 15 per cent of the beetle larvae. These parasites, however, have never been known to become abundant enough to control the mountain pine beetle. Artificial methods are the only sure methods known and recommended.

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Fig. 1. Adult mountain pine beetle.

Fig. 2. Photograph of inner surface of bark of western white pine showing characteristic work of the mountain pine beetle.

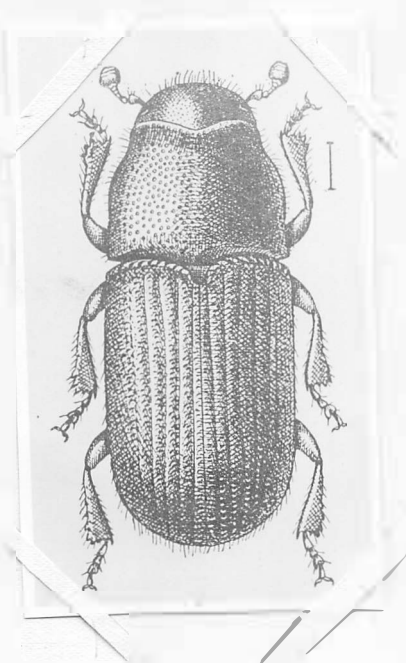


Fig 1



Fig 2